



# Operation Manual

PRODUCT NAME

Mechanical Valve

MODEL / Series / Product Number

VFM300 Series

Made-to-Order Products (X207A, X219A)

**SMC Corporation**

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# Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)<sup>\*)</sup>, and other safety regulations.

\*) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components  
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components  
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements  
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots  
etc.



**Danger**

**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

**Warning**

**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

**Caution**

**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



## Warning

### **1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

### **2. Only personnel with appropriate training should operate machinery and equipment.**

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

### **3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

### **4. Our products cannot be used beyond their specifications. Our products are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not covered.**

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.



# Safety Instructions

## Caution

**We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.**

**Use in non-manufacturing industries is not covered.**

Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.

The new Measurement Act prohibits use of any unit other than SI units in Japan.

## Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

### Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\* 2)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

**\*2) Vacuum pads are excluded from this 1 year warranty.**

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty

### Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

## Design precautions

### **Warning**

#### **(1) Actuator drive**

When an actuator, such as a cylinder, is to be driven take appropriate measures to prevent potential danger caused by actuator operation.

#### **(2) Maintenance space**

Allow sufficient space for maintenance and inspection.

#### **(3) Ventilation**

When using the valve in a closed control panel, etc., install ventilating openings to prevent an increase of pressure inside the control panel, and to prevent heat generated by other equipment from building up.

## Selection

### **Warning**

#### **(1) Confirm the specifications.**

The product is designed for use only in compressed air systems. Do not use fluids other than compressed air. Do not operate at pressures or temperatures, etc., beyond the range of specifications, as this can cause damage or malfunction.

#### **(2) Use in low temperature environments**

When using the valve in a low temperature condition, take appropriate measures to avoid freezing of drainage, moisture etc. in low temperature.

## Mounting

### **Warning**

#### **(1) If air leakage increases or the equipment does not operate properly, stop operation.**

Unexpected motion can cause injury and equipment damage.

#### **(2) Check the mounting conditions**

Make sure that screws and fittings are properly tightened and the piping is not bent or flattened. Connect the compressed air supply to the product and perform appropriate functional and leakage inspections to check it is mounted properly.

#### **(3) Painting of the valve**

Models or specifications printed or marked on the product should not be erased, removed or covered up.

Do not paint resin parts, as this may have an adverse effect due to the solvent in the paint.

### **Caution**

#### **(1) The piping other than the coil tube is assumed to be static.**

If the tube moves, for example in a flexible moving tube, it may become worn, elongated or torn due to tensile forces, or disconnected from the fitting. Ensure the tube is in a static condition at all times before using. After installation and maintenance, apply air supply to the equipment and perform appropriate functional and leakage inspections to make sure the equipment is mounted properly.

#### **(2) Transportation, installation, piping, wiring, operation, handling, and maintenance should be performed by personnel with sufficient knowledge and experience.**

There is a risk of injury.

### (3) Do not disassemble or modify the product.

This may cause human injury and/or an accident.

### (4) Do not wipe the product using chemicals.

## Piping

### ! Caution

#### (1) Before piping

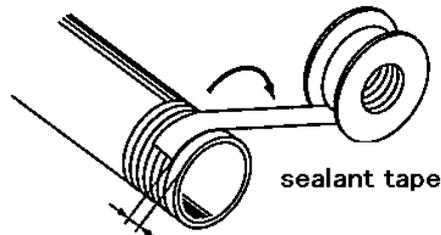
Before piping, blow air (flush) or clean the piping to remove any cutting chips, cutting oil, dust, etc. from the piping.

#### (2) Piping to product

When piping to the product, refer to the symbols and labels on the product to avoid mistakes in the position of the supply port, etc.

#### (3) Sealant tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not enter the mechanical piping. If sealant tape is used, leave 1.5 to 2 threads exposed at the end.



leave 1.5 to 2 threads exposed at the end.

#### (4) One-touch fitting installation

Refer to Fittings & Tubing Precautions from 1 to 5 shown in Best Pneumatics on SMC's website (URL <https://www.smcworld.com>) for the recommended piping conditions.

#### (5) Connection of fittings

##### 1) Connecting fitting to the valve

When installing SMC fittings, follow the procedures below.

##### Tightening Torque for applicable piping

Connection screw	Appropriate tightening torque (Nm)	For reference
M5	1 to 1.5	First, tighten it by hand, then give it an additional approximately 1/6 to 1/4 turn with the wrench.
1/8	3 to 5	Add 2 to 3 turns using a tightening tool after tightening by hand.
1/4	8 to 12	Add 2 to 3 turns using a tightening tool after tightening by hand.

#### (6) Follow the procedures of the manufacturer when fittings other than SMC are used.

Confirm that no problem will occur in the operating conditions.

#### (7) If positioning is required, if the fitting is loosened after it has been tightened, it may cause air leakage.

Insufficient tightening may loosen the thread or cause air leakage.

## Lubrication

### **Caution**

#### **(1) Lubrication**

1. The product has been lubricated for life by the manufacturer, and does not require lubrication in service.
2. Use turbine oil Class 1, ISO VG32 (with no additives), if lubricated.

Besides, if the lubrication is suspended halfway, the original lubricant will be lost and may result in a malfunction. Be sure to keep lubricating continuously. For details about lubricant manufacturers' brands, refer to the SMC website.

## Air Supply

### **Warning**

#### **(1) Use clean air.**

Do not use compressed air that contains chemicals, organic solvents based synthetic oils, salts or corrosive gases, etc., as this can cause damage or malfunction.

### **Caution**

**(1) If ultra dry air is used as a fluid, the lubrication characteristics of the equipment will deteriorate and this can affect the reliability (life) of the product.**

#### **(2) Install an air filter.**

Install an air filter upstream, near the valve. A filtration degree of 5 micron millimeter or less should be selected.

#### **(3) Install an aftercooler, air dryer or drain catch before the filter.**

Do not use compressed air containing a lot of condensate, which can cause the operating failure of the product and other pneumatic equipment. Therefore, take appropriate measures to ensure air quality, such as by providing an after cooler, air dryer, or water separator.

#### **(4) If excessive carbon powder is seen, install a mist separator on the upstream side of the valve.**

If excessive carbon powder is generated from the compressor, it can stick to the inside of the valve and cause operation failure.

#### **(5) Grease is applied to the inner parts of the valve.**

Grease may enter on the downstream side of the valve.

**For detailed information regarding the quality of the compressed air described above, refer to SMC's Cleaning Systems".**

## Operating Environment

### **Warning**

- (1) Do not use in an environment where corrosive gases, chemicals, sea water, water or steam are present.**
- (2) Do not operate in a location subject to vibration or impact.**
- (3) Use a protective cover, etc. to shield the product from direct sunlight.**
- (4) Shield the product from radiated heat generated by nearby heat sources.**
- (5) Employ suitable protective measures in a location where there is contact with oil or welding spatter, etc.**
- (6) If there is a lot of dust, install a silencer onto the exhaust port of the valve to prevent the dust from entering the valve.**
- (7) Do not operate it in an area in which fluids such as oil, coolant, or water splash on it or dust comes in contact with it.**

Because it does not have a waterproof or dustproof construction, fluids or dust could enter the valve, leading to malfunction. Therefore, take measures such as providing a protective cover to prevent direct exposure.

## Maintenance

### **Warning**

#### **(1) Removal of equipment, and supply/exhaust of compressed air**

When equipment is serviced, first confirm that measures are in place to prevent dropping of driven objects and/or equipment running out of control, etc. Then cut the supply pressure and power, and exhaust all compressed air from the system using its residual pressure release function.

When the equipment is to be started again after remounting, first confirm that measures are in place to prevent lurching of actuators, etc., and then confirm that the equipment can operate normally.

#### **(2) Before performing maintenance, confirm that measures are taken to prevent sudden action and protect workers.**

#### **(3) Draining**

Remove condensate from air filters regularly. If condensation in the drain bowl is not emptied on a regular basis, the bowl will overflow. This may cause the malfunction of pneumatic equipment.

If the drain bowl is difficult to check and remove, the installation of a drain bowl with an auto drain option is recommended.

## Specific Product Precautions for Mechanical Valve

### Design precautions

#### **Warning**

**(1) Cannot be used for sealing pressure.**

This product cannot be used for an application in which the pressure must be sealed because there will be a slight leakage.

**(2) Not suitable for use as an emergency shutoff valve, etc.**

The mechanical valves are not designed for safety applications such as an emergency shutoff valve. If the valves are used for the mentioned applications, additional safety measures should be adopted.

#### **Caution**

**(1) This product cannot be pressurized backwards.**

Air pressure cannot be supplied from the 2C1 and 4C2 port.

**(2) This product cannot be used with negative pressure.**

Please keep the operating pressure within the specification range.

**(3) It is possible to select N.C. or N.O. specification**

The product can be used as a 3 port valve normal closed (N.C.) by plugging 2C1 port, and normal open (N.O) by plugging 4C2 port. Do not plug the exhaust ports (5E2 or 3E1) during use.

**(4) When there is an orifice at the exhaust, do not use the product in a sealed condition.**

### Mounting

#### **Warning**

**(1) Do not move the mechanical operation beyond the operating limit position.**

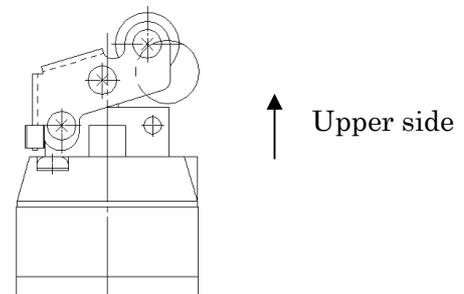
This could damage the mechanical valve itself and lead to equipment malfunction. Refer to Mechanical Operating Conditions on Chapter 4 of this Operation Manual.

**(2) Never perform additional machining such as enlarging the body mounting hole.**

Scratches or dust may result in air leakage.

**(3) Roller lever type valve is recommended to be mounted in the orientation that the roller lever faces upward.**

Strokes that are shown in Chapter 4 in this Operation Manual are the values when the valve is operated with the roller lever facing upward as shown in the Fig. If the valve is operated in other mounting orientations, the values may be different from those shown in Chapter 4 due to potential changes in the clearance of the components of the roller lever.



**(4) When tightening the fastening ring at the time of mounting the panel mount type, do not hold the valve body whilst performing tightening.**

Failure to follow this instruction may cause the bracket to be deformed, which may lead to a malfunction. Be sure to perform assembly while holding the actuator body. (Refer to page 16.)

## Operation

### **Warning**

**(1) Operate all manual mechanical valves with your finger.**

If equipment such as a cylinder, cam or hammer is used, the mechanical valve will be damaged, which may result in malfunction of the equipment.

**(2) Select the angle and the maximum speed of the operating cam and the dog of the mechanism so that they do not exceed the maximum values.**

This could damage the mechanical valve itself and lead to equipment malfunction. Refer to Chapter 4, "Mechanical Operating Conditions" in this Operation Manual for the main precautions.

**(3) As the VFM series are pilot operated mechanical valves, when primary pressure is no longer being supplied due to the current operating state, the built-in spring will return the main valve to the non-operating state position. For this reason, when the supply of primary pressure is resumed, in the times it takes for the pilot pressure to be recovered, there may be some instantaneous output from 1 to 2 (S to C1).**

Therefore, pay attention to the behavior of the product when resupplying air pressure.

### **Caution**

**(1) After operating for a long time, it will take some time for the valve to restart as the resistance between the seal and the parts increases.**

Please consult SMC if the operating condition is maintained for a long period of time.

## Maintenance

### **Warning**

**(1) Perform inspection on a regular basis as necessary, such as at the beginning of operation, to make sure that the mechanical valve operates properly.**

**(2) Do not disassemble, repair or modify the product. Do not perform additional machining.**

This may lead to malfunction of equipment, injury and equipment damage.

**(3) Strokes of the roller lever type and roller plunger type.**

When the actuator performs strokes with something like a cam always rotated in contact with the roller of the actuator, the roller may be worn and it may cause change in the strokes.

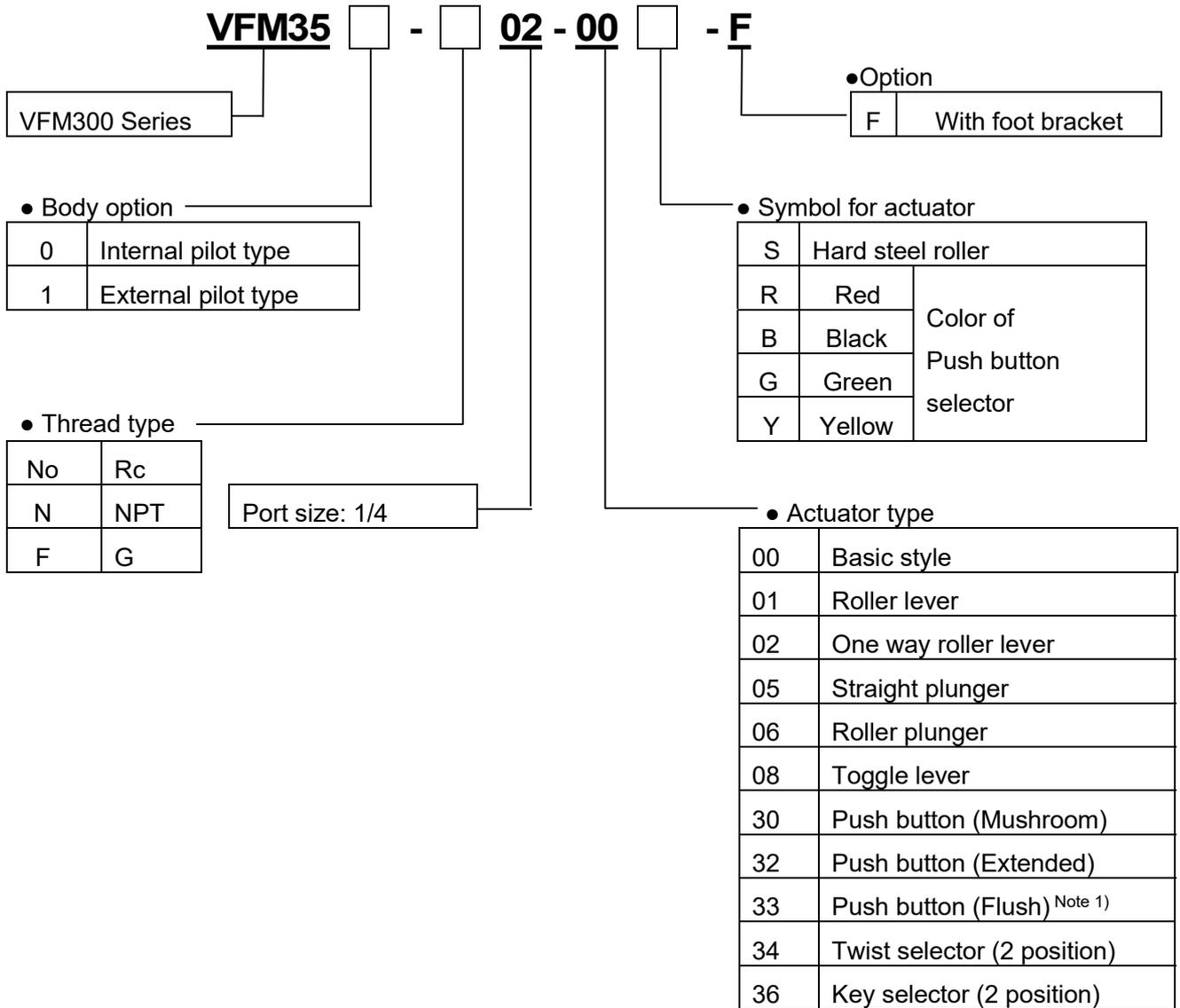
Ensure that the actuator stroke is within the stroke range shown in section 4 when the product is serviced.

## 2. Specifications

	Internal pilot	External pilot		
Fluid	Air and inert gas			
Operating pressure	0.15 to 0.9 MPa	Main valve	0 to 0.9 MPa	
		Pilot pressure	0.15 to 0.9 MPa	
Operating temperature	-5 to 60° C (No freezing)			
Flow characteristics		C [dm <sup>3</sup> / (s · bar)]	b	Cv
	1(S) ⇒ 2(C1) / 4(C2)	4.0	0.36	1.0
	2(C1) / 4(C2) ⇒ 3(E2) / 5(E1)	3.1	0.32	0.75
Lubrication	Not required (Use turbine oil Class 1 ISO VG32, if lubricated.)			
Port size	Main valve	SUP., Outlet port	1/4	
		EXH. port	1/8	
	Pilot valve (EXH. port)	M5x0.8		
Accessories	Note) Foot bracket			
Construction	Elastic spool			
JIS symbol				
Weight (Basic type)	190g			

Note1) The configuration of the body with foot bracket is special. Bracket cannot be added afterwards.

### 3. How to Order



Note 1) When selecting the flush type, it is not necessary to select the suffix for the actuator.

## 4. Mechanical operating conditions

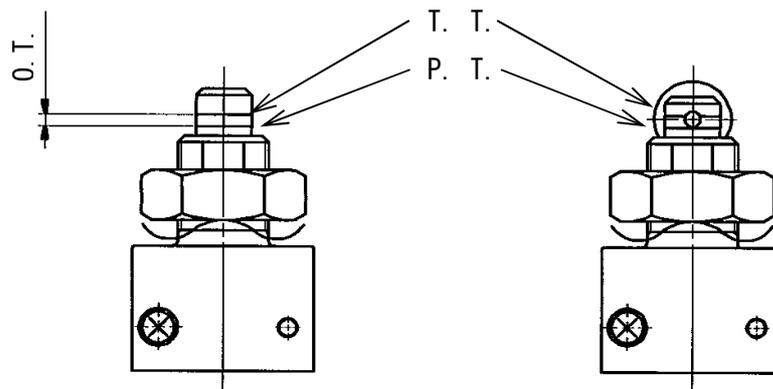
4-1.

Actuator type	F.O.F.at 0.5 MPa <sup>Note 1)</sup>	P.T. <sup>Note 1)</sup>	O.T. <sup>Note 1)</sup>	T.T. <sup>Note 1)</sup>	Stroke range (P.T.+0.5×O.T.) to (P.T.+O.T.-0.1) <sup>Note 1)</sup>
Basic style	16 N	1 mm	2 mm	3 mm	2.0 to 2.9 mm
Roller lever	8 N	2.2 mm	4 mm	6.2 mm	4.2 to 6.1 mm
One way lever	7 N	2.4 mm	4.6 mm	7 mm	4.7 to 6.9 mm
Straight plunger	20 N	1.5 mm	2 mm	3.5 mm	2.5 to 3.4 mm
Roller plunger	20 N	1.5 mm	2 mm	3.5 mm	2.5 to 3.4 mm
Toggle lever	15 N	—	—	40°	—
Push button (Mushroom)	21 N	4.8 mm	1.7 mm	6.5 mm	—
Push button (Extended)	21 N	4.8 mm	1.7 mm	6.5 mm	—
Push button (Flush)	21 N	4.8 mm	1.7 mm	6.5 mm	—
Twist selector (2 position)	23 N	—	—	90°	—
Key selector (2 position)	26 N	—	—	90°	—

Note 1. Representative values are shown here. P.T. depends on pressure or individual difference between products. **Keep the mechanical operating stroke value within the range of values obtained by calculation in the table to close the value securely.**

**Note 2. Do not move more than operation limit (T.T.).**

The plunger type rod has grooves as guidelines for P.T. and T.T.



4-2. Angle and maximum speed limit for cam and dog

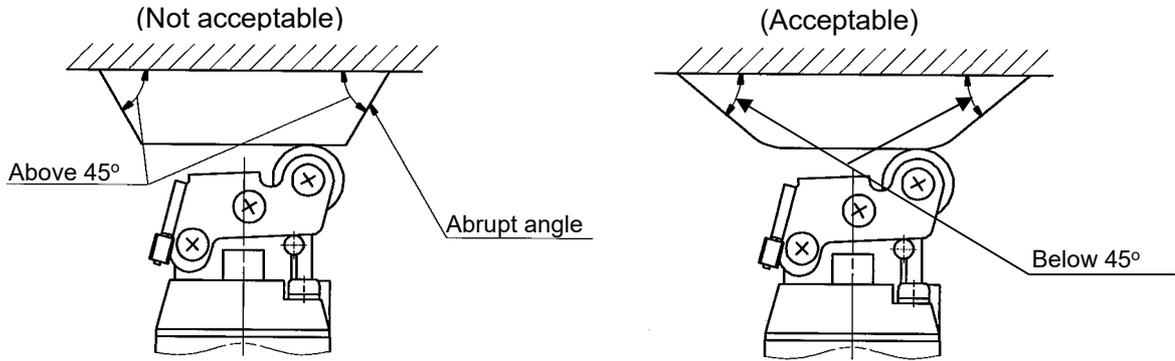
Actuator	Dog angle	Max. speed limit for dog
Roller lever	30°	1.5
	45°	0.7
One way roller lever	30°	0.7
	45°	0.3
Straight plunger	-	0.4
Roller plunger	30°	0.7

4-3. Cam and dog materials

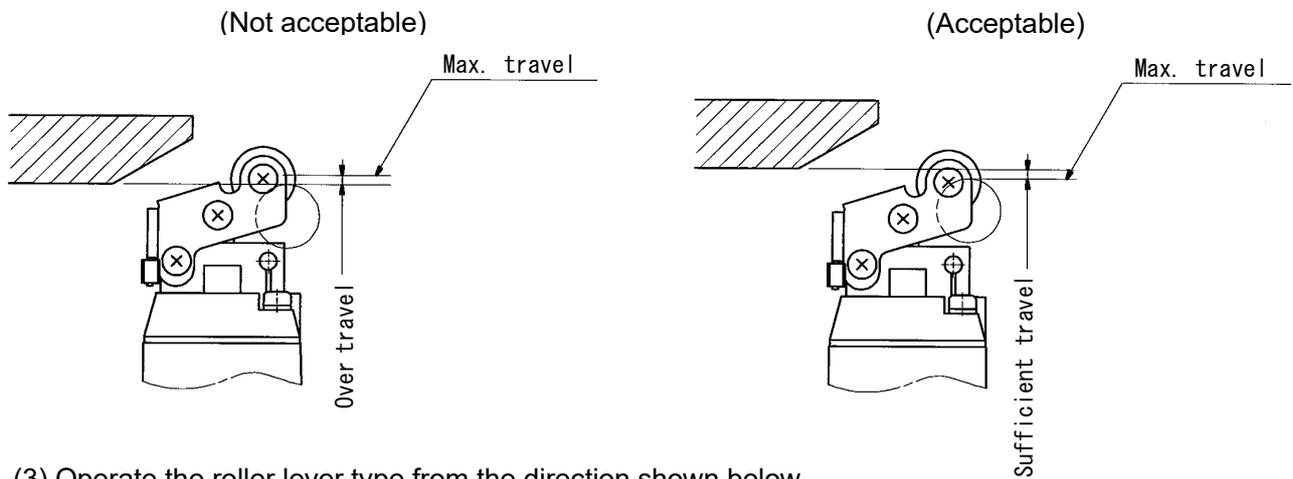
Roller material	Dog material	Finish accuracy for dog
Polyacetal	Metal	Rz6.3 or less
Hard steel	Metal, resin	Rz12.5 or less

#### 4-4. Operation mechanism and configuration

(1) Avoid acute angles on limit switch actuator.

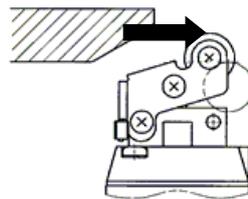


(2) Do not move more than max. travel

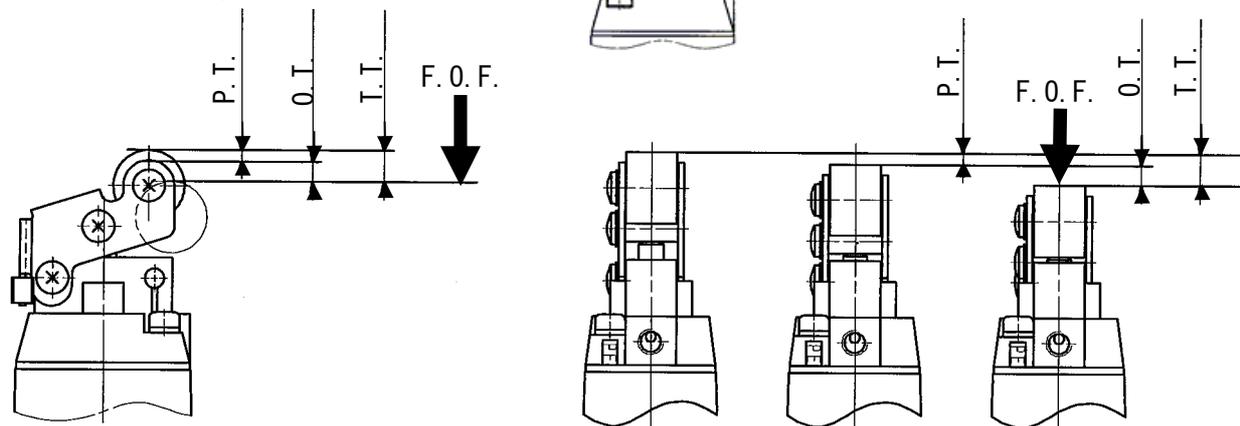


(3) Operate the roller lever type from the direction shown below.

In cases where the dog goes over the actuator, select the one way roller lever type.



#### 4-5. Definition of Symbols



F.O.F. <Full Operating Force> ... Required force to total travel position.

P.T. <Pre-travel> ... From free position to initial valve operating position.

O.T. <Over Travel> ... From initial valve operating position to total travel position.

T.T. <Total Travel> ... From free position to total travel position.

## 5. Operating force

Full operating force increases according to the increase of the supply pressure.

Full operating force for each product type can be found by the formula below.

$$F \text{ (N)} \doteq \frac{F_1 \text{ (N)}}{1.6 \text{ (N)}} \times F_2 \text{ (N)}$$

$F_1$ : Full operating force at 0.5MPa of the product type (Page 12, F.O.F)

$F_2$ : Full operating force at supply pressure found from Fig.1

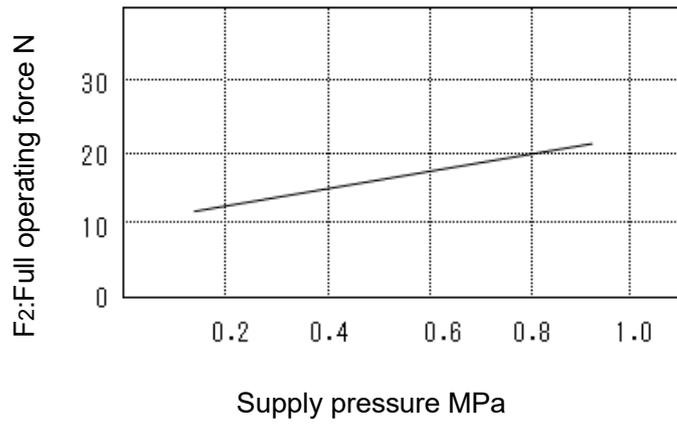
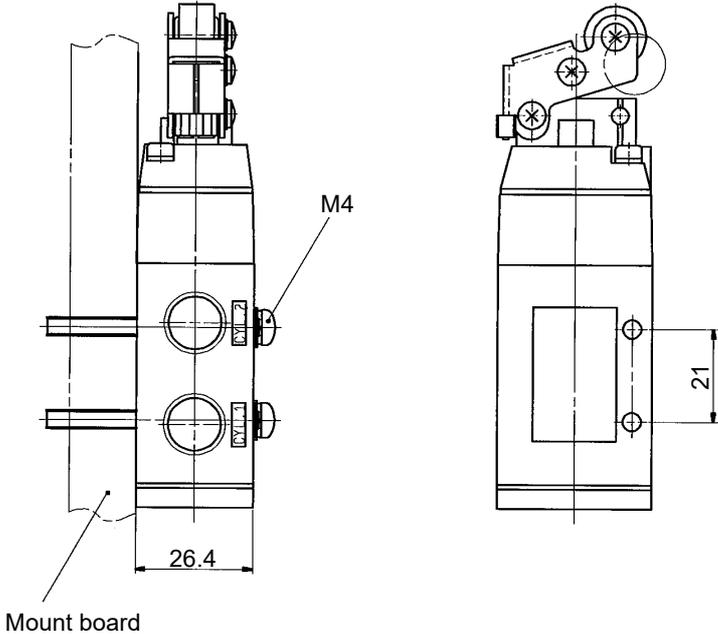
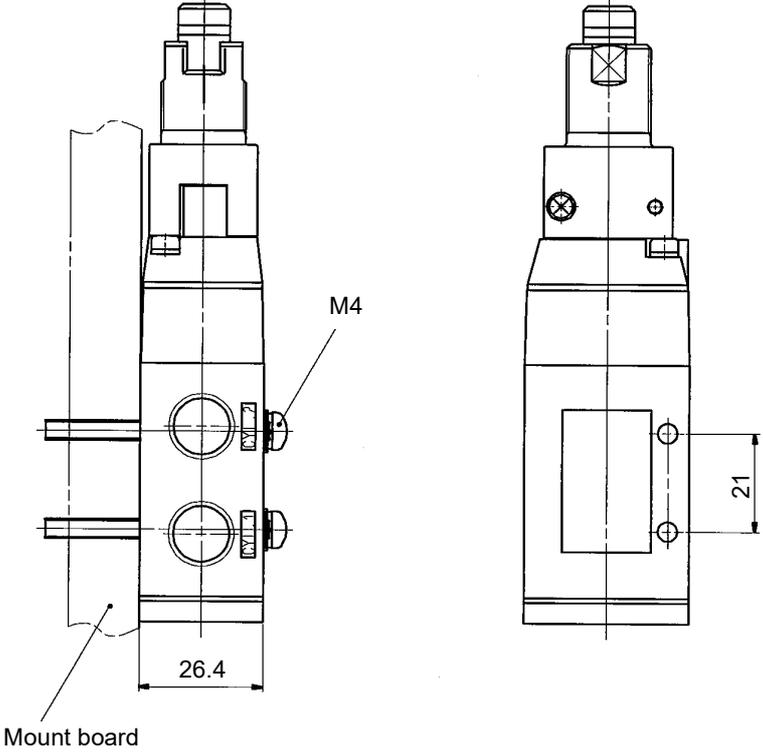
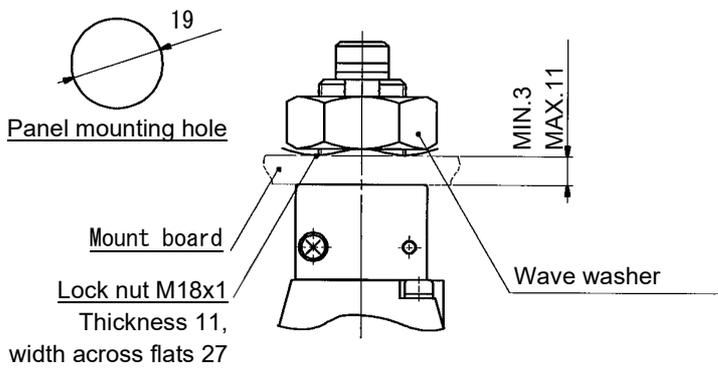
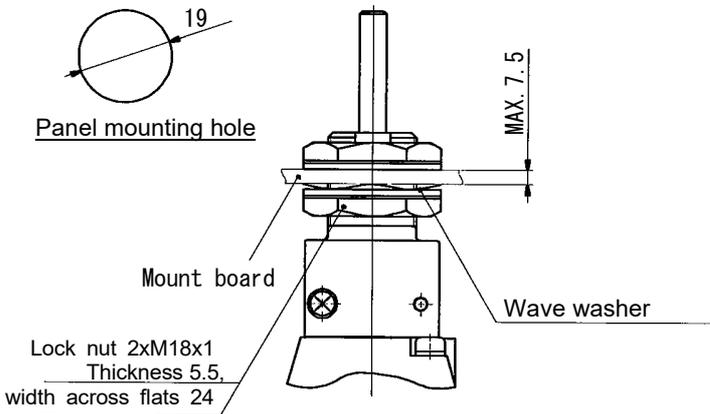
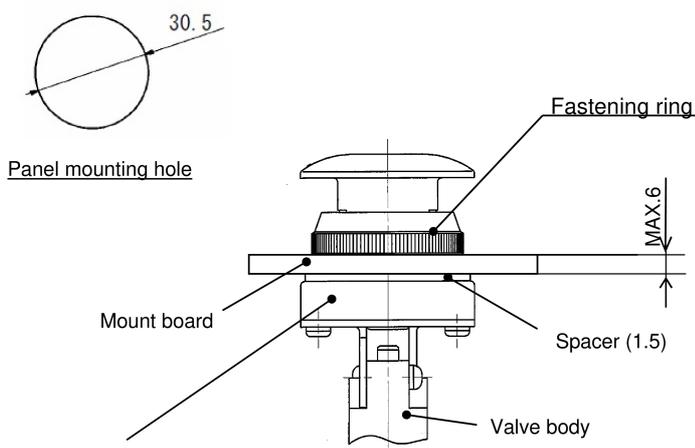


Fig. 1

## 6. Installation and mounting orientation

Type	Mounting dimensions
Roller lever  One way roller lever	<p data-bbox="483 259 1043 286">Use 2 mounting holes on the body using M4 screws.</p> 
Straight plunger  Roller plunger  Toggle lever	<p data-bbox="483 1034 963 1099">When using body mounting holes Remove attached lock nut and wave washer.</p> 

Type	Mounting dimensions
Straight plunger  Roller plunger	<p>Mounting to the panel using the lock nut included as an accessory.</p>  <p>Panel mounting hole 19</p> <p>Mount board</p> <p>Lock nut M18x1 Thickness 11, width across flats 27</p> <p>Wave washer</p> <p>MIN. 3 MAX. 11</p>
Toggle lever	<p>Mounting to the panel using the lock nut included as an accessory.</p>  <p>Panel mounting hole 19</p> <p>Mount board</p> <p>Lock nut 2xM18x1 Thickness 5.5, width across flats 24</p> <p>Wave washer</p> <p>MAX. 7.5</p>
Push button (Mushroom)  Push button (Extended)  Push button (Flush)  Twist selector (2 position)  Key selector (2 position)	<p>Mount to <math>\varnothing 30.5</math> hole using the ring on top. When the product is mounted onto a board with thickness of about 6mm, use a 1.5mm spacer. (3 spacers are included as accessories)</p>  <p>Panel mounting hole 30.5</p> <p>Fastening ring</p> <p>Mount board</p> <p>Spacer (1.5)</p> <p>Valve body</p> <p>MAX. 6</p> <p>Portion to be held during tightening (Actuator body)</p> <p>When tightening the fastening ring, do not hold the valve body. Failure to follow this instruction may cause the bracket to be deformed, which may result in a malfunction.</p>

## 7. Replacement parts

### 7-1. Replacement parts number

- Basic style

No replacement parts.

- Actuator

Actuator can be changed and replaced. Refer to the next page for Replacement of the Actuator  
(1) Actuator number

	Actuator	(1) Product number for the actuator.	Applicable
Mechanical operation	Roller lever	VM-01C	POM roller
		VM-01CS	Hard steel roller
	One way roller lever	VM-02C	POM roller
		VM-02CS	Hard steel roller
	Straight plunger	VM-05D	-
	Roller plunger	VM-06D	POM roller
VM-06DS		Hard steel roller	
Manual override	Toggle lever	VM-08D	-
	Push button (Mushroom)	VM-30CR	Red
		VM-30CB	Black
		VM-30CG	Green
		VM-30CY	Yellow
	Push button (Extended)	VM-32CR	Red
		VM-32CB	Black
		VM-32CG	Green
		VM-32CY	Yellow
	Push button (Flush)	VM-33C	One set includes red, black, green and yellow.
	Twist selector (2 position)	VM-34CR	Red
		VM-34CB	Black
		VM-34CG	Green
VM-34CY		Yellow	
Key selector (2 position)	VM-36C	-	

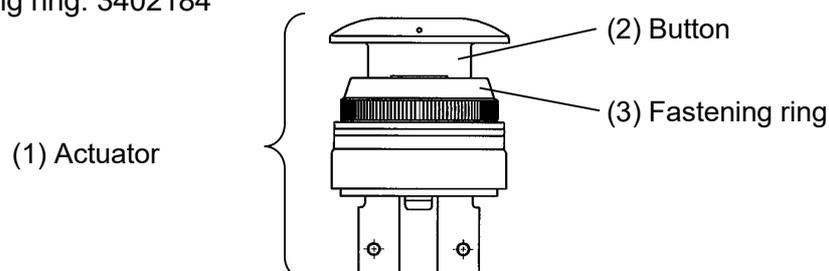
#### (2) Button number ( Only standard model types. )

Button can be replaced by the head.

Selector head (for 2 position) cannot be replaced on its own.

Color	Push button (Mushroom)	Push button (Extended)	Push button (Flush)
Red	3402186R	3402187R	3402188R
Black	3402186B	3402187B	3402188B
Green	3402186G	3402187G	3402188G
Yellow	3402186Y	3402187Y	3402188Y

#### (3) Fastening ring: 3402184



## 7-2 Replacement of the Actuator

### 7-2-1. Lever type

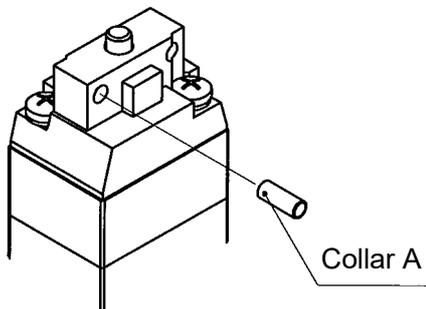
#### 1) Parts

Description	Qty.	Remarks
Lever head	1	
Collar A	1	Accessories
Cross recessed binding head screw	1	M3x14 Accessory
Conical spring screw for hexagon socket head cap screw	1	Nominal 3 accessory

#### 2) How to Install

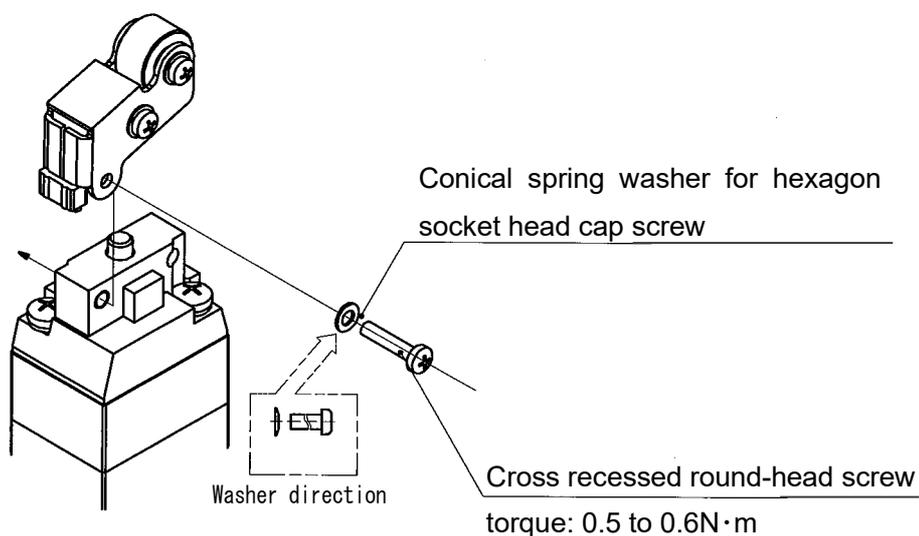
(1) Insert the collar A to the hole for mounting the actuator.

\* Note To extend the life of this part, apply grease to the external circumference of the collar A.  
(Use lithium grease)



(2) Install the lever head, and tighten it with washer using a screw.

\* Note Recommended tightening torque is 0.5 to 0.6Nm. Tightening torque over 0.6Nm will damage the lever.

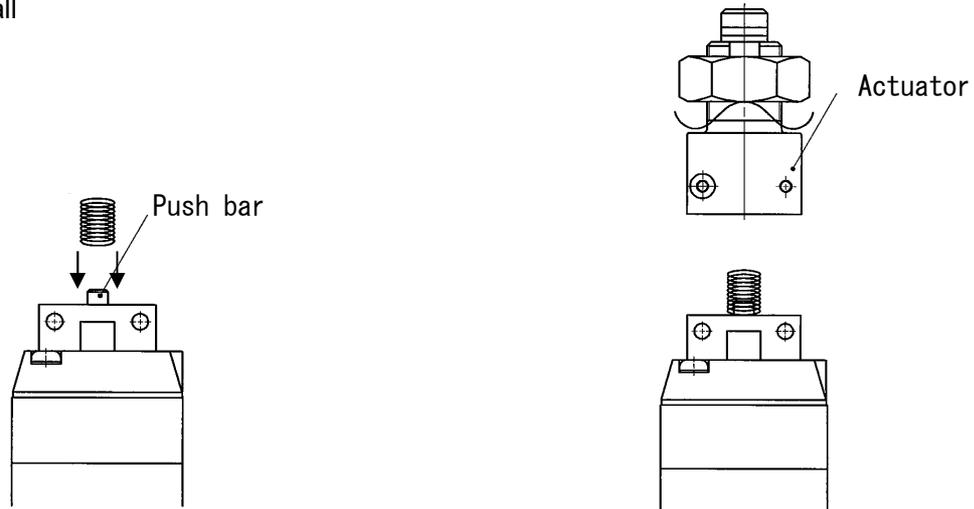


## 7-2-2. Plunger and flip toggle

### 1) Parts

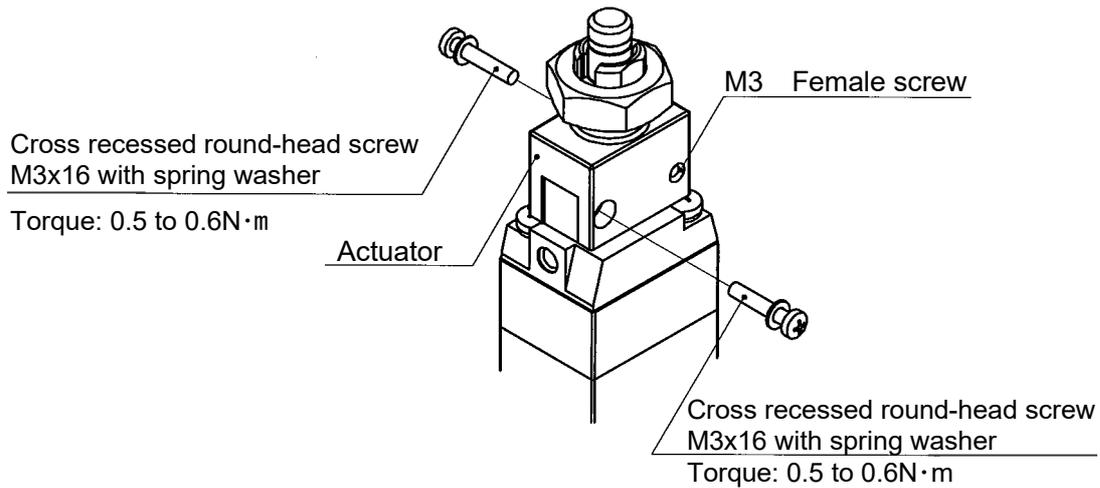
Description	Qty.	Remarks
Plunger head	1	
Flip toggle head		
Spring	1	Accessories
Cross recessed round head screw with built in spring washer.	2	M3x16 Accessory

### 2) How to Install



(1) Put the spring around the push bar of the base body

(2) Place the actuator onto the base body.



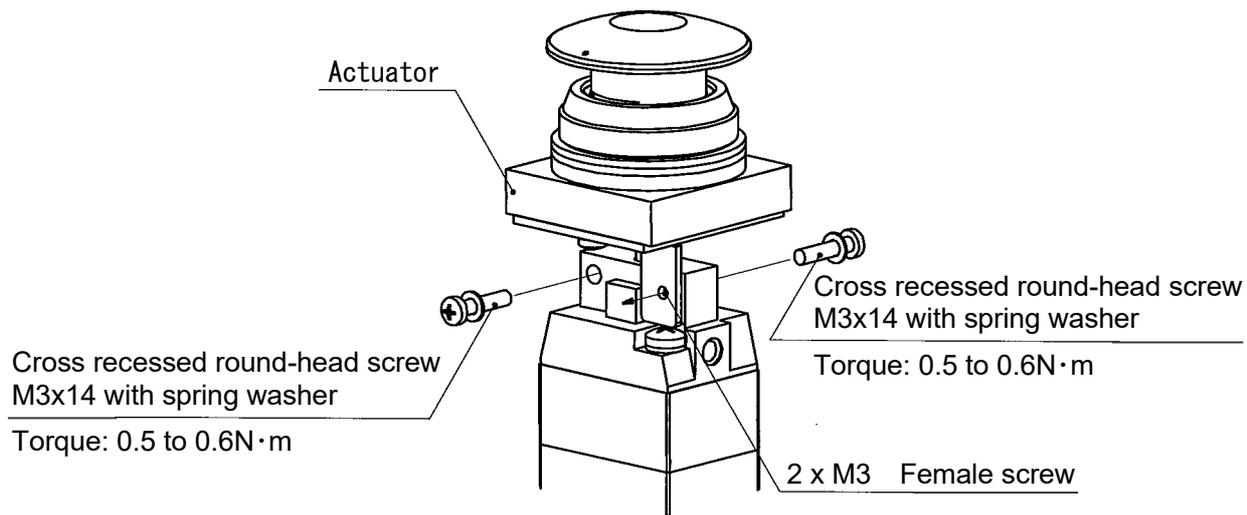
(3) Tighten the screw

7-2-3.Button, selector type

1) Parts

Description	Qty.	Remarks
Button head Selector head	1	
Cross recessed round head screw with built in spring washer.	2	M3x14 Accessory

2) How to Install



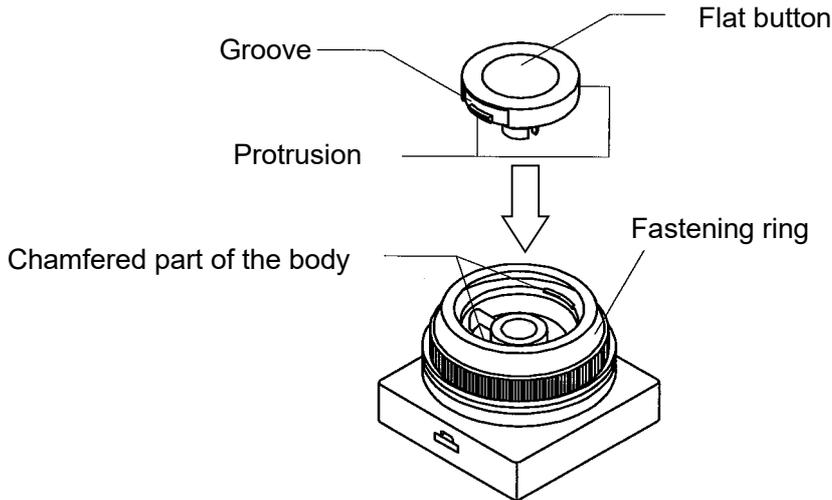
### 7-3. Change of button

Follow the procedure below to change the button.

#### (1) Push button (Flush type)

Installation - Of the four colors, red, green, black, and yellow, select and align the protruding portion of the button with the recessed portion of the body and push in.

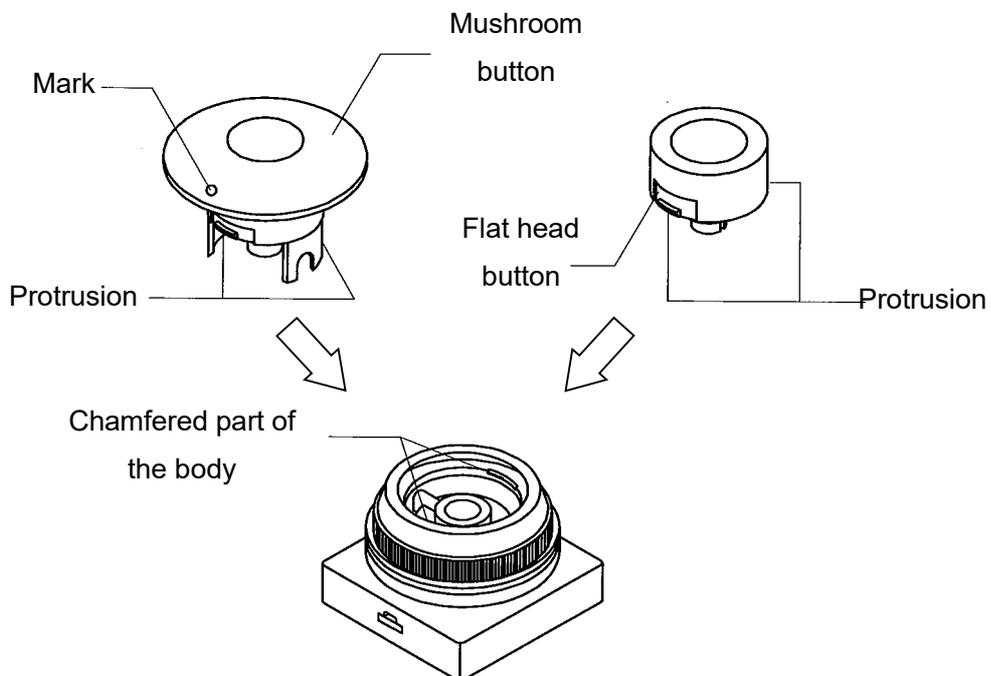
Removal - Remove the fastening ring and insert the tip of a small flat screwdriver into the groove of the button to pry it up.



#### (2) Mushroom button and flat head button

One specified button is set when the product is shipped.

	Mushroom button	Flat head button
Installation	Align the protruding part of the button with the recessed part of the body and push in. (Use the mark on the button as a reference to align the protruding part)	Align the protruding part of the button with the recessed part of the body and push in.
Removal	Use your thumb to pry the button upwards.	Remove the fastening ring. Insert a small screwdriver into the groove of the button to take the button out.



## 8. Panel Mounting Method for Made-to-Order Products (X207A, X219A)

### 8-1. Specifications

X207A · · · · Alternate Type, Mushroom Push Button

X219A · · · · Push-lock Turn-reset Type, Mushroom Push Button

### 8-2. Precautions for mounting

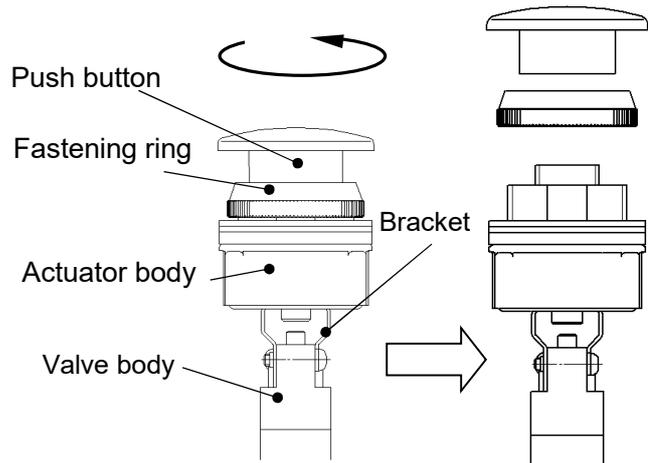
#### [Task 1] Removal of the push button and fastening ring

Remove them from the body turning them counterclockwise in the order of the pushbutton and fastening ring.

#### ! Caution

When mounting on a panel, be sure to hold the actuator body to tighten or remove the push button and fastening ring. If you work by holding the valve body, a load is applied in the tensile direction, which may lead to deformation of the bracket.

If the bracket is deformed, the mechanical valve will not operate properly.

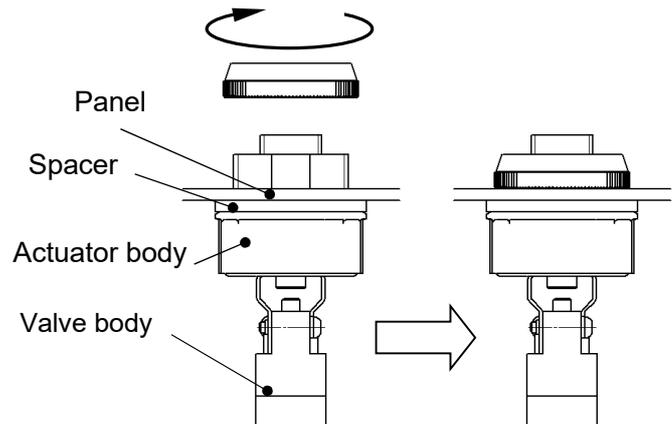


Remove the push button by holding the actuator body.

#### [Task 2] Mounting the valve to the panel

By holding the actuator body, insert the valve to the panel and fix it by using the fastening ring.

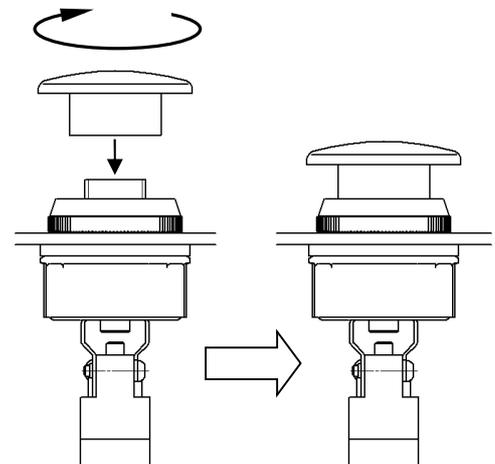
Remove three spacers attached to the valve depending on the panel thickness



Mount the push button by holding the actuator body

#### [Task 3] Mounting the push button

Tighten the push button clockwise by hand and further tighten it until load is applied.



## 9. Installation of Made-to-Order Products (X207A) with Mechanical Valve

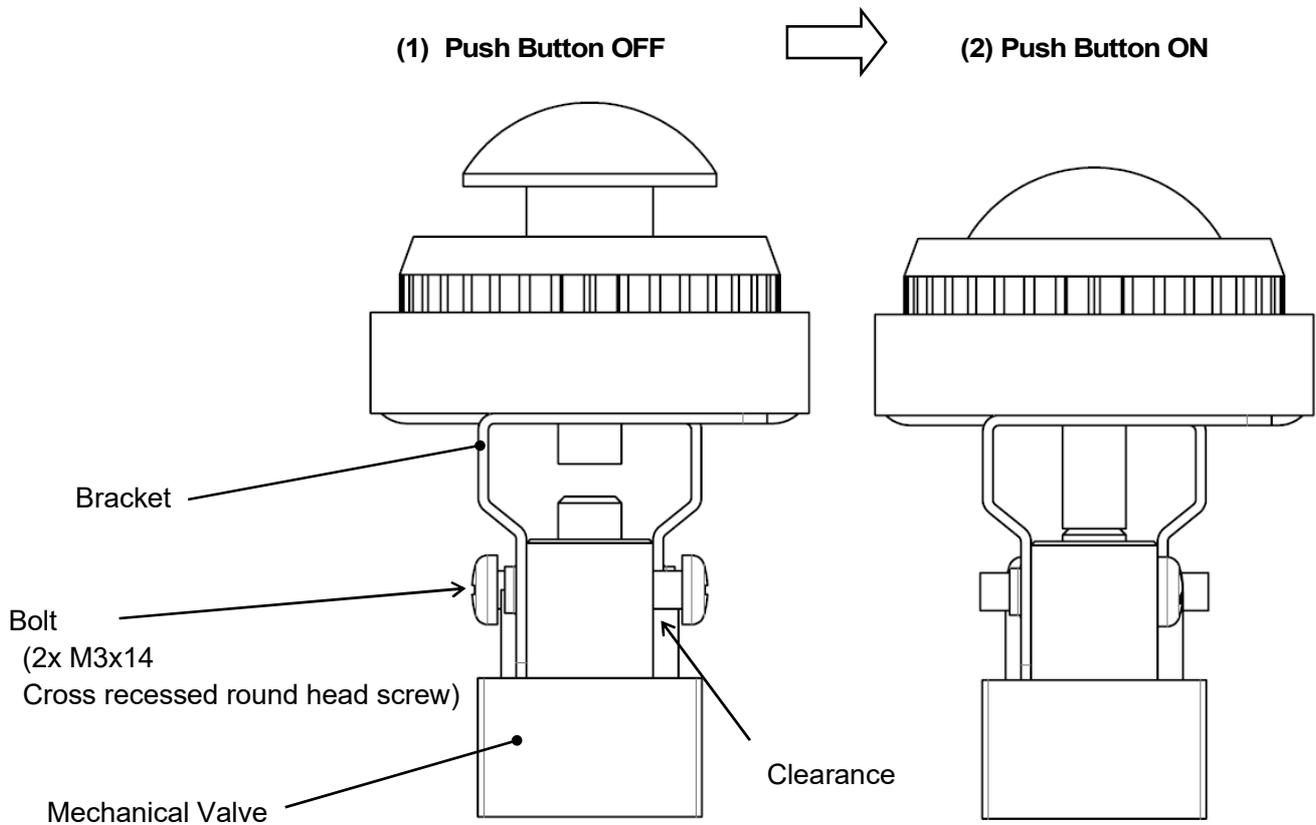
### 9-1. Specifications

X207A · · · · Alternate Type, Mushroom Push Button

### 9-2. Precautions for mounting

[Task 1] Temporarily fasten the bracket and the mechanical valve using bolts, leaving a slight gap between the two components. This indicates the temporarily fastened state.

[Task 2] While keeping the push button in the pressed position, perform final tightening of the bolts. Apply a tightening torque of 0.5 to 0.6 N·m.



#### Revision history

B: Change of the note on the operating environment (7) and Safety Instructions. Addition of Made-to-Order Products. Change of tightening torque value. Correction of operation stroke range and Fig.1 at page.14	2024.2
C. Additional Installation Instructions for Made-to-Order Products (X207A) with Mechanical Valve	2025.8

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.  
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